
PART I - ADMINISTRATIVE

Section 1. General administrative information

Title of project

Yakima/Klickitat Fisheries Project -- Umbrella

BPA project number: 20510

Contract renewal date (mm/yyyy):

☒ Multiple actions?

Business name of agency, institution or organization requesting funding

Yakama Indian Nation

Business acronym (if appropriate) YIN

Proposal contact person or principal investigator:

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NPPC Program Measure Number(s) which this project addresses

7.4K, 7.1A, 7.1B, 7.1C, 7.1D, 7.1F, 7.2D, 7.3B, 7.4A, 7.6A, 7.6A.2, 7.6B.3, 7.6B.6, 7.6D, 7.7, 7.8E

FWS/NMFS Biological Opinion Number(s) which this project addresses

NMFS Biological Opinion for the 1995 to 1998 Hatchery Operations in the Columbia River Basin (NMFS 1995a), BPA's Biological Assessment of 1997-2001 Hatchery Operations of the Proposed Cle Elum Hatchery, December 1995 (BPA 1995). NMFS letter dated 4/1/96

Other planning document references

1. Yakima Fisheries Project Final Environmental Impact Statement (1/96)
 2. Yakima Fisheries Project Spring Chinook Supplementation Monitoring Plan (Busack et al, 1997).
 3. Wy Kan Ush Me Wa Kush Wit (CRITFC 1995), Vol 1: pp 5A-2; 5B-13 through 5B-12; Vol 2: pp57 &59.
 4. NPPC Yakima and Klickitat Subbasin Plans
 5. The ISRG's Return to the River (Williams et al. 1996) -- Restoration of Salmonid Fishes in the Columbia River Ecosystem: Chapter 2.
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Short description

Umbrella proposal describing YKFP activities in four major work areas: Monitoring and Evaluation; Operation and Maintenance; Management, Data and Habitat; and Design and Construction.

Target species

Yakima and Klickitat Subbasin spring chinook, fall chinook, and coho. Steelhead are not being produced at this time, but are being reconditioned at the Prosser Fish Facility.

Section 2. Sorting and evaluation

Subbasin

Yakima and Klickitat subbasins

Evaluation Process Sort

CBFWA caucus	Special evaluation process	ISRP project type
Mark one or more caucus	If your project fits either of these processes, mark one or both	Mark one or more categories
<input checked="" type="checkbox"/> Anadromous fish <input type="checkbox"/> Resident fish <input type="checkbox"/> Wildlife	<input type="checkbox"/> Multi-year (milestone-based evaluation) <input type="checkbox"/> Watershed project evaluation	<input type="checkbox"/> Watershed councils/model watersheds <input type="checkbox"/> Information dissemination <input checked="" type="checkbox"/> Operation & maintenance <input checked="" type="checkbox"/> New construction <input checked="" type="checkbox"/> Research & monitoring <input checked="" type="checkbox"/> Implementation & management <input type="checkbox"/> Wildlife habitat acquisitions

Section 3. Relationships to other Bonneville projects

Umbrella / sub-proposal relationships. List umbrella project first.

Project #	Project title/description
20510	Yakima/Klickitat Fisheries Project -- Umbrella
9506325	YKFP Monitoring and Evaluation
8811525	YKFP Design and Construction
8812025	YKFP Management, Data & Habitat
9701725	YKFP Operation and Maintenance
9506404	YKFP Project Management (WDFW)
20132	Yakima River Basin Water Temperature Monitoring and Modeling

Other dependent or critically-related projects

Project #	Project title/description	Nature of relationship
9200220	Physiological assessment of wild and hatchery juvenile salmonids	Physiological/developmental monitoring of hatchery and wild spring chinook juveniles (parr/smolt)
5510200	Yakima River side channel survey and rehabilitation	Complementary habitat enhancement in upper Yakima
5510800	Upper Yakima tributary irrigation improvement	Restores passage to tributaries blocked by irrigation diversions.
5510900	Teaaway River instream flow restoration	Complementary adult passage project (NF Teaaway is an acclimation/release site).
9705100	Yakima Subbasin Side Channels	Restores juvenile salmonid rearing habitat
9100	Re-establish safe access into tributaries of Yakima Subbasin	Improve juvenile salmonid passage and rearing.
9101	Restore upper Toppenish Creek watershed	Improve juvenile salmonid passage and rearing.
9102	Ahtanum Creek watershed assessment	Improve juvenile salmonid passage and rearing.
9603501	Satus Cr. Watershed Restoration	Improve juvenile salmonid passage and rearing.
9506404	WDFW Policy/Technical Involvement/Planning YKFP	Co-Managers, YKFP

9105500	Supplementation Fish Quality (Yakima Subbasin)	NMFS contract to develop rearing treatment alternatives to increase hatchery fish survival.
9200900	Yakima screens phase II O & M	Basin juvenile salmonid passage
9105700	Yakima phase II screen fabrication	Basin juvenile salmonid passage
9705600	Lower Klickitat riparian & in-channel habitat enhancement project.	Critical habitat enhancement and information sharing.
	Yakima Subbasin Habitat/Watershed Project Umbrella	Umbrella proposal summarizing nine projects intended to promote normative Yakima Subbasin ecosystem by protecting and restoring habitat for all life stages of anadromous fish and wildlife.

Section 4. Objectives, tasks and schedules

Past accomplishments

Year	Accomplishment	Met biological objectives?
	See individual YKFP Umbrella sub-proposals	See individual YKFP Umbrella sub-proposals

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	To test the hypothesis that supplementation techniques can be used in the Yakima and Klickitat River basins to increase natural production and to improve harvest opportunities		See individual YKFP Umbrella sub-proposals
2	To maintain the long-term genetic fitness of the wild and native salmonid populations and keep adverse ecological interactions within acceptable limits		See individual YKFP Umbrella sub-proposals
3	To provide knowledge about the use of supplementation, so that it may be used to mitigate effects on anadromous fisheries throughout the Columbia River Basin		See individual YKFP Umbrella sub-proposals
4	To maintain and improve the quantity and productivity of salmon and steelhead habitat, including those areas made accessible by habitat improvements		See individual YKFP Umbrella sub-proposals
5	To ensure that Project implementation remains consistent with the Council's Fish and Wildlife Program		See individual YKFP Umbrella sub-proposals
6	To implement the Project in a prudent and environmentally sound manner		See individual YKFP Umbrella sub-proposals

Objective schedules and costs

Obj #	Start date mm/yyyy	End date mm/yyyy	Measureable biological objective(s)	Milestone	FY2000 Cost %
1	1/2000	12/2000	See individual YKFP Umbrella sub-proposals		
2	1/2000	12/2000	See individual YKFP Umbrella sub-proposals		
3	1/2000	12/2000	See individual YKFP Umbrella sub-proposals		
4	1/2000	12/2000	See individual YKFP Umbrella sub-proposals		
5	1/2000	12/2000	See individual YKFP Umbrella sub-proposals		
6	1/2000	12/2000	See individual YKFP Umbrella sub-proposals		
				Total	0.00%

Schedule constraints

See individual YKFP Umbrella sub-proposals

Completion date

2048

Section 5. Budget

FY99 project budget (BPA obligated): \$10,312,159

FY2000 budget by line item

Item	Note	% of total	FY2000
Personnel	Items are sub-proposal totals. The YKFP umbrella itself has no associated costs.	%28	2,559,572
Fringe benefits		%5	477,231
Supplies, materials, non-expendable property		%8	752,170
Operations & maintenance		%4	408,740
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		%11	985,585
NEPA costs		%1	100,000
Construction-related support		%0	0
PIT tags	# of tags: 105,144	%3	304,918
Travel		%1	77,604
Indirect costs		%12	1,079,076
Subcontractor		%27	2,547,782
Other		%0	0
TOTAL BPA FY2000 BUDGET REQUEST			\$9,292,678

Cost sharing

Organization	Item or service provided	% total project cost (incl. BPA)	Amount (\$)
	See individual YKFP Umbrella sub-proposals	%0	
		%0	
		%0	
		%0	
Total project cost (including BPA portion)			\$9,292,678

Outyear costs

	FY2001	FY02	FY03	FY04
Total budget	\$9,829,101	\$13,377,186	\$11,314,461	\$9,924,403

Section 6. References

Watershed?	Reference
<input type="checkbox"/>	See individual YKFP Umbrella sub-proposals
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

PART II - NARRATIVE

Section 7. Abstract

The Yakima/Klickitat Fisheries Project (YKFP or Project) is a supplementation project designated by the Northwest Power Planning Council, the Yakama Indian Nation (YIN), the Washington Department of Fish and Wildlife (WDFW), and the Bonneville Power Administration (BPA) as the principal means of protecting, mitigating and enhancing the anadromous fish populations in the Yakima and Klickitat River basins. It is the largest supplementation project within the Northwest Power Planning Council's Fish and Wildlife Program.

The Project's production and research activities will be brought on-line in gradual stages. The first phase (tier) targets the supplementation of depressed populations of upper Yakima River spring chinook. This initial phase also includes research designed to determine the feasibility of re-establishing a naturally spawning population and a significant fall fishery of coho salmon in the Yakima basin. Future phases of the YKFP include supplementation of fall chinook and steelhead, and a reintroduction of now extirpated stocks. Also envisioned for the Project's future is fish production (which could include the introduction of supplementation) in the Klickitat basin. Fish production in the basin will include the use of the Klickitat Hatchery, a Mitchell Act facility now operated by WDFW.

Given the number and diversity of Project objectives, tasks, and facilities, its co-managers, Yakama Indian Nation and Washington Department of Fish and Wildlife, in cooperation with the Bonneville Power Administration and Council staff, agreed to organize all Project activities within one *umbrella* document. It is the managers belief that an *umbrella* approach provides the best opportunity for readers unfamiliar with the Project to understand its varied components and their relationships.

This document briefly describes the Project *umbrella*, and the Project activities, within its four major work areas, that fall under the Project *umbrella*. These areas are: Monitoring and Evaluation, Operation and Maintenance, Management, Data and Habitat, and Design and Construction. Each of the four subject areas will comprise *sub-proposals* (e.g. the Monitoring and Evaluation *sub-proposal*), under which Project activities within each area will be described in detail.

Section 8. Project description

a. Technical and/or scientific background

Project Need

Yakima River Basin. The primary native anadromous fish species targeted for active management in the Yakima River basin are spring chinook, fall chinook, coho and steelhead. The protection, mitigation, and enhancement of these anadromous fish resources in the Yakima River basin is a high priority objective of the Council's Columbia River Basin Fish and Wildlife Program (Program). The Council considers the Yakima River basin a primary location for mitigation to compensate for losses from development and operation of hydroelectric projects elsewhere in the Columbia Basin.

The Council selected the Yakima River basin for supplementation for two reasons:

1. fisheries resources in the basin are severely reduced from historic levels, and
2. the Project has a significant potential for mitigation of effects on these resources.

In addition, the Council believes that the YKFP will help determine the role that supplementation will play in increasing natural production of anadromous salmonids throughout the Columbia Basin. The Project responds directly to a need for knowledge of viable means to rebuild and maintain naturally spawning anadromous fish stocks. Therefore, the YKFP has been designed (1) to provide resource managers with knowledge regarding supplementation and (2) to identify and apply improved methods for carrying out hatchery production and supplementation of natural production.

Klickitat River Basin. The primary native anadromous fish species targeted for active management in the Klickitat River basin are spring chinook, fall chinook, coho and steelhead. The goal for these species is to restore sustainable, naturally producing populations to support tribal and non-tribal harvest while protecting the biological integrity and genetic diversity of the watershed. The YKFP serves as the vehicle for planning the introduction of supplementation strategies into the basin. The Council's goal is to restore and enhance stock and stock status – focusing on areas made accessible by habitat improvements.

Please refer to the individual *sub-proposals* for a description of the technical and scientific background of each Project component.

b. Rationale and significance to Regional Programs

NPPC Program Compliance

The YKFP's planning, construction and operation has been mandated by the NPPC's Columbia River Basin Fish and Wildlife Program ("Program") Measure 7.4K, *Yakama Production Facilities* and 7.4K.1, which called for the construction of the Cle Elum Research and Supplementation Facility (CESRF). As illustrated by the following table, YKFP development and implementation has complied with Program design and operations requirements for artificial production programs.

YKFP Compliance With NPPC Program Measures

MEASURE	DESCRIPTION	PROJECT ACTION	CM*
7.1A	<i>Evaluation of Carrying Capacity</i>	Basin studies completed and findings incorporated into experimental design	yes
7.1B	<i>Conserve Genetic Diversity</i>	Genetics studies completed and findings incorporated into experimental design	yes

YKFP Compliance With NPPC Program Measures (cont.)

MEASURE	DESCRIPTION	PROJECT ACTION	CM*
7.1C	<i>Collection of Population Status, Life History and Other Data on Wild and Naturally Spawning Populations</i>	Basin studies completed and incorporated into experimental design	yes
7.1D	<i>Wild and Naturally Spawning Population Policy</i>	Policies incorporated into experimental design	yes
7.1F	<i>Systemwide and Cumulative Impacts of Existing and Proposed Artificial Production Projects</i>	Basin studies completed and findings incorporated into design and operations	yes
7.2D	<i>Improved Propagation at Existing Facilities</i>	Studies completed and incorporated into YKFP experimental design	yes
7.3B	<i>Final Planning and Implementation of Proposed High Priority Supplementation Projects</i>	YKFP implementation	NA
7.4A	<i>Identify, Evaluate and Implement New Production Initiatives</i>	YKFP implementation	NA
7.6A	<i>Habitat Goal</i>	YKFP implementation	yes
7.6A.2	<i>Maintain and Improve Quantity and Productivity of Salmon and Steelhead Habitat</i>	YKFP implementation	yes
7.6B.3	<i>Prioritize Habitat Improvement Actions to Protect Identified Weak Stocks and to Areas Where Broader Watershed Improvement Efforts Are Underway</i>	YKFP implementation	yes
7.6B.6	<i>Encourage Involvement in Cooperative Habitat Enhancement Projects</i>	YKFP implementation	yes
7.6D	<i>Habitat Objectives</i>	Incorporated into Project design	yes
7.7	<i>Cooperative Habitat Protection and Improvement With Private Landowners</i>	YKFP implementation	yes
7.8E	<i>Land Exchanges, Purchases and Conservation Easements</i>	YKFP implementation	yes

* Compliance Monitoring

Project development has been subject to the *NMFS Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia River Basin* (NMFS 1995a) and *BPA's Biological Assessment of 1997-2001 Hatchery Operations of the Proposed Cle Elum Hatchery, December 1995* (BPA 1995). NMFS concurred with these documents by letter dated 4/1/96.

Environmental Compliance

The Project's EIS was completed in 1996, and the Record of Decision ("ROD") was signed by BPA's Administrator and Chief Executive Officer, Randall W. Hardy, on March 13, 1996. The EIS covered all spring chinook supplementation efforts, including the construction of the CESRF and its three acclimation sites. It also covered the coho feasibility studies. Yakima River fall chinook and steelhead work and Klickitat River basin activities are subject to further environmental review. Environmental review of all Project activities is ongoing.

Please refer to the individual *sub-proposals* for a description of how each Project component relates to regional fish and wildlife programs.

c. Relationships to other projects

As noted above, the Yakima/ Klickitat Fisheries Project Umbrella covers the following Project components or *sub-proposals*: YKFP Monitoring and Evaluation *sub-proposal*, Project # 9506325; YKFP Management, Data and Habitat *sub-proposal*, Project # 8812025; YKFP Operations and Maintenance *sub-proposal*, Project # 9701725; YKFP Design and Construction *sub-proposal*, Project # 8811525; and Policy/Technical Involvement and Planning for YKFP (WDFW), Project # 9506404.

NPPC's Fish and Wildlife Program habitat improvement projects in the Yakima subbasin relate to the YKFP as they will influence the quality of the environment the fish face. Projects 5510200 and 9705100, "Yakima River Side Channel Survey" and "Yakima River Side Channel Restoration", are intended to correct one of the most serious environmental problems in the upper Yakima: the lack of fry rearing habitat provided by side channels. A series of riparian and instream flow enhancement projects targeting streams in or bordering the Yakama Indian Reservation – and therefore primarily benefiting steelhead – include projects 9100, 9101, 9102, and 9603501: "Re-establish Safe Access into Tributaries of the Yakima Subbasin", "Restore Upper Toppenish Creek Watershed", "Ahtanum Creek Watershed Assessment", and "Satus Creek Watershed Restoration", respectively. Projects 5510800 ("Upper Yakima Tributary Irrigation Improvement") and 5510900 ("Teanaway River Instream Flow Restoration") both attempt to restore adult and juvenile passage to upper Yakima tributaries dewatered or blocked by irrigation diversions. The Teanaway project is especially important because an acclimation site will be located on the North Fork of the Teanaway River.

Finally, projects 9105700 and 9200900 provide funds for the WDFW Yakima screen shop and the Yakima Project Office of the Bureau of Reclamation (BOR) to build and maintain screens on irrigation diversions and to maintain fisheries monitoring and enhancement facilities (fish ladders, the Chandler and Roza smolt traps, the Roza adult trap, etc.) owned by the BOR.

A critical habitat enhancement project in the Klickitat subbasin is project 9705600, "Lower Klickitat Riparian and In-channel Habitat Enhancement".

Please refer to the individual *sub-proposals* for a description of how each Project component relates to other regional fish and wildlife projects.

d. Project history (for ongoing projects)

The YKFP was first approved by the Northwest Power Planning Council in 1982. The development of the Project's Master Plan, which included a supplementation research program, began in 1985. On October 15, 1987, the Council approved the YKFP's Master Plan, which included the construction of the production and acclimation facilities in the Upper Yakima River Basin. Consistent with the NPPC's Columbia River Basin Fish and Wildlife Program ("Program") Measure 7.4K.1, the Project's Preliminary Design Report was completed in 1990.

In 1992, the Project began the process of preparing an Environmental Impact Statement ("EIS"). The Project's EIS was completed in 1996, and the Record of Decision ("ROD") was signed by BPA's Administrator and Chief Executive Officer, Randall W. Hardy, on March 13, 1996. The construction of the YKFP's Cle Elum Supplementation and Research Facility (CESRF) began in May of 1996. The CESRF was completed on August 1, 1997. The CESRF's three acclimation facilities in the Upper Yakima river subbasin are scheduled to be completed December of 1998. YKFP fish production activities basin are described in the O & M *sub-proposal*.

Please refer to the individual *sub-proposals* for historical details on each Project component.

e. Proposal objectives

Salmonid Species Covered by YKFP Activities

Yakima River basin		Klickitat River basin	
spring chinook	fall chinook	spring chinook	fall chinook
coho		coho	
steelhead		steelhead	

The YKFP's General Objectives, Strategies and Methods

The YKFP's core objectives are as follows:

1. To test the hypothesis that new supplementation techniques can be used in the Yakima and Klickitat River basins to increase natural production and to improve harvest opportunities, while maintaining the long-term genetic fitness of the wild and native salmonid populations and keeping adverse ecological interactions within acceptable limits;
2. To provide knowledge about the use of supplementation, so that it may be used to mitigate effects on anadromous fisheries throughout the Columbia River Basin;
3. To maintain and improve the quantity and productivity of salmon and steelhead habitat, including those areas made accessible by habitat improvements;
4. To ensure that Project implementation remains consistent with the Council's Fish and Wildlife Program; and,
5. To implement the Project in a prudent and environmentally sound manner.

Supplementation is defined as the utilization of artificial propagation in an attempt to maintain or increase natural production while maintaining long-term fitness of the target population and while keeping ecological and genetic impacts on nontarget species within specified limits (RASP 1991). As applied by the YKFP, its goal (as distinct from conventional hatchery practices) is to increase the numbers of naturally spawning fish in the Yakima and Klickitat basins. Its ultimate goal is to sustain naturally spawning populations with a high enough survival rate to be able to phase out artificial propagation when critical habitat improvements have reached a point that artificial enhancement is no longer necessary.

Current YKFP operations have been designed to test the principles of supplementation. The Project's experimental design has focused on the following critical uncertainties affecting supplementation:

1. the survival and reproductive success of hatchery fish after release from the hatchery;
2. the impacts of hatchery fish as they interact with non-target species and stocks; and,
3. the effects of supplementation on the long-term genetic fitness of fish stocks.

In order to resolve these uncertainties, Project managers will develop a complete set of objectives and strategies for supplementing Yakima and Klickitat River basins' stocks. At this time, objectives and strategies have been developed for upper Yakima spring chinook. Such objectives and strategies are precise and increasingly specific statements about the YKFP in four categories: genetics, natural production, ecological interactions, and harvest. Strategies include steps to contain unacceptable genetic and ecological risks.

The Project's first phase in the Yakima River basin includes the supplementation of upper Yakima spring chinook. The Project is also undertaking feasibility studies of Yakima River fall chinook and coho stocks for future incorporation into the supplementation program. New facilities of various types will be required to implement Yakima River fall chinook and coho programs. Baseline stock status, life history and habitat inventory data is also being collected for Yakima River steelhead and all Klickitat River basin stocks for Ecosystem Diagnosis and Treatment (EDT) modeling. Initiation of YKFP production activities in the Klickitat basin will likely require the development of new facilities. The YKFP serves as the vehicle for planning the introduction of supplementation strategies into the basin. Project emphasis is also placed upon restoration of critical habitat.

In the ongoing upper Yakima spring chinook program, two repeated tests or treatments are being tested: a Semi-Natural Innovative Treatment ("SNT") and an Optional Conventional Treatment ("OCT"). OCT fish will be incubated, reared, and acclimated using the currently accepted "Best Technology" used at state, Tribal, and Federal salmonid hatcheries. SNT fish will be incubated, reared, and acclimated in a more natural environment (e.g., cover, naturally colored raceways, and structures). The SNT treatment was designed to raise and release fish with characteristics and behavior similar to those of naturally produced fish in order to achieve improved survival and productivity.

OCT and SNT fish will be compared (e.g., in terms of physical characteristics and survival to returning adults) with each other as well as to naturally produced fish. These comparisons will be used to determine whether the spring chinook program is moving toward a successful outcome. A definitive demonstration of success – the detection of a significant increase in natural origin recruits – will take many years. Therefore, interim measures that are consistent with progress must be monitored to determine whether the Project is on course. Information on environmental conditions (inside and outside the basin), harvest, and other activities and factors will be used to provide a context for interpretation of YKFP findings.

The YKFP's specific long-term objectives for spring and fall chinook, steelhead and coho in the areas of experimental, natural production, ecological interactions, genetics and harvest are contained in the following tables.

Upper Yakima Spring Chinook Objectives

Experimental
<ul style="list-style-type: none"> • Test the hypothesis that new supplementation techniques can be used in the Yakima and Klickitat Subbasins to increase natural production and to improve harvest opportunities, while maintaining the long-term genetic fitness of the wild and native salmonid populations and keeping adverse ecological interactions within acceptable limits.
Genetic
<ul style="list-style-type: none"> • Manage genetic risks (extinction, loss of within- and between-population variability, and domestication selection) to all stocks from management of the fishery. • Conserve upper Yakima and Naches stocks of spring chinook salmon. • Conserve the American River stock of spring chinook salmon.
Natural Production

<ul style="list-style-type: none"> • Optimize natural production of spring chinook with respect to abundance and distribution. • Optimize natural production of spring chinook salmon while managing adverse impacts from interactions between and within species and stocks. • Maintain upper Yakima spring chinook natural production at a level that would contribute an annual average of at least 3,000 fish to the Yakima Basin adult return. • Maintain natural escapement of upper Yakima spring chinook (hatchery and wild) at an average of at least 2,000 adult returns and consistently greater than 1,700 spawners per year. • Learn to use supplementation as defined by the RASP (RASP, 1992) to increase natural production of upper Yakima spring chinook and increase harvest opportunities.
Harvest
<ul style="list-style-type: none"> • Increase harvest opportunities for all fishers consistent with requirements of genetic, natural production, and experimentation objectives.

Yakima River Coho Objectives

Experimental
<ul style="list-style-type: none"> • Determine the feasibility of re-establishing a sustainable, naturally spawning coho population in the Yakima Basin with sufficient productivity to sustain a meaningful in-basin fishery in most years.
Natural Production
<ul style="list-style-type: none"> • Optimize production of naturalized populations of coho with respect to abundance and distribution.
Ecological Interactions
<ul style="list-style-type: none"> • Minimize adverse impacts of coho reintroduction on non-target taxa of concern (NTTOC). • Limit losses of wild and hatchery coho smolts to native and exotic predators to levels that do not significantly limit coho production potential.
Genetic
<ul style="list-style-type: none"> • Establish a Yakima River coho stock with heritable life history traits adapted to the Yakima River Basin, and track life history characteristics changes during broodstock development.
Harvest
<ul style="list-style-type: none"> • Expand harvest opportunities for treaty Indian and sport fisheries inside and outside of the Yakima River Basin while meeting objectives for genetics, experimentation, natural production and ecological interactions.

Yakima River Fall Chinook Objectives

Experimental
<ul style="list-style-type: none"> • Determine the feasibility of re-establishing a sustainable, naturally spawning fall chinook population(s) in the Yakima Basin with sufficient productivity to sustain a meaningful in-basin fishery in most years.
Natural Production
<ul style="list-style-type: none"> • Optimize natural production of fall chinook with respect to abundance and distribution. • Use supplementation as described by RASP (1991) (i.e., to increase natural production of Yakima fall chinook and increase harvest opportunities, while keeping genetic and ecological impacts within acceptable limits) to provide scientific benefits to the region.
Ecological Interactions
<ul style="list-style-type: none"> • Keep adverse impacts of fall chinook supplementation on non-target taxa of concern (NTTOC) within prescribed limits.

<ul style="list-style-type: none"> Limit losses of wild and hatchery fall chinook smolts to native and exotic predators to levels that do not significantly limit coho production potential.
Genetic
<ul style="list-style-type: none"> Minimize genetic risks- extinction, loss of within-population variability, loss of between-population variability, and domestication selection to Marion Drain and mainstem stocks.
Harvest
<ul style="list-style-type: none"> Increase harvest opportunities for all fishers consistent with the requirements of genetic, natural production, and experimentation objectives.

Klickitat Salmon and Steelhead

Experimental
<ul style="list-style-type: none"> Use life history and habitat data in the EDT model to evaluate alternative stock specific enhancement strategies.
Natural Production
<ul style="list-style-type: none"> Enhance production of spring and fall chinook, coho and steelhead with respect to abundance and distribution, salmon while managing adverse impacts from interactions between and within species and stocks.
Genetic
<ul style="list-style-type: none"> Manage genetic risks (extinction, loss of within- and between-population variability, and domestication selection) to all stocks from management of the fishery.
Harvest
<ul style="list-style-type: none"> Increase harvest opportunities for all fishers consistent with requirements of genetic, natural production, and experimentation objectives.

The YKFP's monitoring activities are intended evaluate the relative survival and success of various release groups of supplementation fish and to compare their success with that of naturally produced fish.

Please refer to the individual *sub-proposals* for a description of each Project component's objectives.

f. Methods

The specific methods employed by the YKFP to implement Project strategies are described in the Project's four *sub-proposals*. Please refer to these documents for specific details.

In order to facilitate a better understanding of the Project, the first section below concentrates on Project management principles and planning tools that ensure the effective and efficient operation of the Project. The second section gives a brief description of the activities covered under the Project's *four sub-proposals*.

Project Management

The YKFP is co-managed by the Yakama Indian Nation (YIN) and the State of Washington. Government representatives form the Policy Group, which is responsible for overall Project management. The YIN is the Project's Lead Agency, which is responsible for implementing all

Project activities. Project science is directed by the Science/Technical Advisory Committee (STAC), which is charged with developing the supplementation strategies employed by the Project.

Project Planning and Management Principles

Adaptive Management and the Control of Risk

YKFP managers have adopted an *adaptive management policy* in order to achieve project goals and protect the basin's fishery resources from unforeseen, adverse project impacts. Adaptive management emphasizes experimental intervention and a willingness to change during implementation. Most importantly, it incorporates the scientific method into Project planning and decision-making. In the implementation of the adaptive management policy, YKFP managers review the benefits and risks of continuing the preferred strategies to meet the Project's objectives. Strategies are retained or adopted *only* if potential benefits exceed foreseeable risks, and if the risks of failure fall within acceptable limits. Risk is managed and reduced over time through implementation of (1) the *Uncertainty Resolution Plan* (URP), (2) the monitoring and evaluation plan and (3) the *Project Annual Review* (PAR). Managers believe that the risk of strategy failure (objectives not met and/or strategies incorrectly implemented) can be reduced through pre-implementation research and risk monitoring.

Planning Status Report

Each year, the STAC prepares a *Planning Status Report* (PSR) for every supplemented species or stock. The PSR documents the objectives, strategies, and operational assumptions for the Project. It reflects the state of knowledge and information available at that point in time. If necessary, new or revised strategy options are developed to implement the objectives and strategies for supplementation in the upcoming year. Additional NEPA and/or SEPA work may be required to address impacts arising from any new supplementation strategies.

Uncertainty Resolution Plan

The URP identifies strategies to resolve uncertainties about operational assumptions. *Resolvable* uncertainties affect strategy implementation, and are given the highest near-term priority. It plays an integral role in preparing the Project's annual work plan. As needed, the STAC will revise the URP.

Project Annual Review

The *Project Annual Review* (PAR) allows YKFP scientists to present and discuss with others the new knowledge gained during the year (1) relative to Project objectives and assumptions stated in the PSR and (2) resulting from resolution work described and scheduled in the URP. The PAR and its ensuing analyses are the processes that provide the feedback loop from the current year's cumulative learning into the following year's PSR and work plans. In the PAR, Project results are compiled; analyzed for relevance, task completion, and percent of uncertainty resolution; and formally documented. The PAR reclassifies the resolution status of specific critical assumptions and identifies spin-off resolution tasks for the coming year. Changes in uncertainty levels of specific assumptions are based on scientific evidence. Scientific documents that form the basis for management decisions undergo peer review.

Brief Description of YKFP Sub-proposals

As note dabove, the implementation of YKFP operations have been broken down into four core areas or *sub-proposals*:

1. the Monitoring and Evaluation (M & E) *sub-proposal* (# 9506325);
2. the Management, Data and Habitat (MDH) *sub-proposal* (# 88120225);
3. the Facility Operations and Maintenance (O & M) *sub-proposal* (# 9701725); and,

4. the Design and Construction (D & C) *sub-proposal* (# 8811525).

The M&E *sub-proposal* covers the monitoring and evaluation of all supplementation strategies, ecological interactions, and genetic impacts. The MDH *sub-proposal* focuses upon meeting the Project's overall management requirements. Project management also includes WDFW's management activities, which are described in a separate project proposal – Policy/Technical Involvement and Planning (Project # 9506404). The O & M *sub-proposal* details the Project's operation and maintenance requirements for the CESRF and other Project facilities. The D & C *sub-proposal* targets the management of the Project's new construction activities, including each activity's actual construction budget. WDFW's Policy/Technical Involvement and Planning for YKFP can be found Project # 9506404.

Brief descriptions of each *sub-proposal* immediately follows below. Detailed descriptions of each *sub-proposal's* objectives, strategies and tasks can be found be referencing their respective project numbers.

Monitoring & Evaluation Sub-Proposal (# 9506325)

The YKFP employs an integrated multi-level monitoring program. The program ensures that:

1. strategies are implemented as intended;
2. experimental studies produce reliable results; and,
3. risks associated with unresolved uncertainties are contained.

The program also ensures efficiency, prevents duplication of effort, and tracks progress toward meeting objectives. Implementation of the monitoring plan, annual review of the findings, and subsequent adjustment of the supplementation program objectives, strategies, assumptions, uncertainties, and risk analysis complete the feedback loop that is essential to the success of the adaptive management process, and ultimately, the entire Project.

The Project's upper Yakima spring chinook monitoring plan, which will be used as a template for monitoring future production of all species in the Yakima and Klickitat basins, addresses the following five monitoring categories:

1. Quality control monitors the performance of the facilities and their operators. Monitoring procedures have been included in the operations manuals for YKFP facilities and field activities.
2. Product specification attributes are monitored at all production facilities, the acclimation ponds, and the juvenile monitoring facilities to determine whether the fish produced by the Project meet goals with respect to: fish health; morphology (size and shape); behavior; and survival.
3. Research monitoring activities have been designed to test the performance of two treatments of artificially reared upper Yakima spring chinook (OCT vs. SNT) and to compare their performance with naturally reared fish. For these fish, monitoring activities are performed at the Roza and Chandler juvenile facilities for outmigrating smolts, at the Prosser and Roza fish ladders and collection facilities for returning adults, and on the spawning grounds for straying rates and reproductive success monitoring. For all other species, monitoring activities will be conducted at existing or newly developed sites in both basins. Research monitoring includes measurements of performance in four main areas:

- natural production (post-release survival and reproductive success);
 - genetic fitness (genetic diversity and long-term stock productivity);
 - ecological interactions (predation, competition, mutualism and disease);
 - harvest.
4. Risk containment consists of a monitoring plan developed to evaluate four categories of interest identified in the risk analysis to monitor risk containment:

- experimental;
- genetic;
- harvest; and,
- natural production/ecological interactions.

These four areas relate back to Project objectives and strategies. The risk analysis defines risk in terms of the probability of failure to meet the objectives of the Project for these four categories.

5. Monitoring of stock status includes measurements of run size and escapement to determine whether harvest objectives can be met without affecting natural production. It would provide information essential to track the long-term performance and fitness of the fish populations.

As stated above, detailed descriptions of all Project monitoring objectives and strategies are contained in the M & E *sub-proposal* (# 9506325).

Management, Data and Habitat *Sub-Proposal* (# 8812025)

The Management, Data and Habitat (MDH) *sub-proposal* describes the YKFP's management and administrative support requirements for Project operations in the Yakima and Klickitat River basins. Management and administrative support responsibilities are shared by the YIN and WDFW. The YKFP's Policy Group (comprised of YIN and WDFW representatives) and YIN/WDFW scientists are responsible for policy development and planning. The Policy Group is also responsible for ensuring that all Project activities are implemented efficiently and effectively. YIN management and administrative personnel are directly responsible for implementing the YKFP's day-to-day operations, including the Project's O & M activities, M & E program, and new facility construction. Project operations are performed by a combination of YIN and WDFW personnel and sub-contractors (as required).

YIN management and administrative support objectives for the YKFP include:

1. Participate in the YKFP's Policy Group:
 - Develop Project policy and ensure implementation;
 - Participate in Project planning efforts, including the PAR and review of PSR's and URP, and ensure implementation;
2. Perform duties of Project's Lead Agency:
 - Manage, direct and ensure implementation of Project operations and activities;
 - Manage and direct all YIN management, administrative, science and technical personnel;
3. Develop a data base for Project data, information and documents, including employment of appropriate personnel;
4. Participate in all meetings affecting Project implementation, including those pertaining to water, habitat and fish passage issues;
5. Coordinate all environmental compliance activities with BPA and WDFW; and,
6. Manage and direct all sub-contractors providing services to the Project.

WDFW management and administrative support objectives for the YKFP include:

1. Participate in the YKFP's Policy Group:
 - Develop Project policy and ensure implementation;
 - Participate in Project planning efforts, including the PAR and review of PSR's and URP, and ensure implementation;
2. Manage and direct all WDFW management, administrative, science and technical personnel participating in Project activities;
3. Coordinate all environmental compliance activities with BPA and YIN; and,
4. Manage and direct all sub-contractors providing services to WDFW in support of the Project.

As stated above, detailed descriptions of all Project management objectives and tasks are contained in the MDH *sub-proposal* (# 8812025).

Operation & Maintenance *Sub-Proposal* (# 9701725)

The O & M *sub-proposal* covers the YKFP's production facilities. These facilities are the Cle Elum Supplementation and Research Facility (CESRF), the Prosser Fish Facility (PFF) and the Marion Drain Fish Facility (MDF). All facilities are operated by the YIN.

The CESRF comprises the greatest part of the Project's O & M work and budget. CESRF construction was completed on August 1, 1997. It includes three acclimation facilities in the upper Yakima River basin, which are under construction and will be completed in December of 1998. The CESRF produces upper Yakima spring chinook. In 1999, the CESRF plans to rear and release 375,000 fish. The PFF produces coho and fall chinook. In 1999, the PFF will rear and release approximately 1.7 million coho and 2.0 million fall chinook. The MDF produces fall chinook. In 1999, the MDF will rear and release approximately 6,000 fall chinook.

The following activities are conducted at all YKFP fish facilities:

1. broodstock collection and sorting;
2. egg collection, fertilization and incubation;
3. juvenile rearing;
4. smolt acclimation and release;
5. facility monitoring and evaluation; and
6. fish pathology monitoring, diagnosis, and treatment.

In addition, work at the CERSF will include implementing and monitoring environmental mitigation measures, which are specified in the CERSF's Mitigation Action Plan (MAP). The MAP will require annual review. MAP measures have been included in the CERSF's operations manual.

Staff requirements to cover all facilities include:

1. complex managers;
2. assistant managers;
3. biologists;

4. research assistants;
5. fish culturists;
6. technicians; and,
7. administrative support staff.

As stated above, detailed descriptions of all Project management objectives and tasks are contained in the O & M *sub-proposal* (# 9701725).

Design and Construction Sub-Proposal (# 8811525)

In order to implement YKFP objectives, the Project will be required to design and construct housing at the CESRF and new fish production facilities at Prosser and Marion Drain. The YIN will manage the design and construction of all new projects.

YKFP construction projects include:

1. two new single family residences at the CESRF;
2. fish production facilities at Prosser and Marion Drain;
3. two single family residences at Prosser;
4. interpretive center design/planning;
5. Lyle Falls (Klickitat subbasin) adult broodstock collection facility design/planning; and,
6. fishway improvement at Lyle and Castile Falls.

As stated above, detailed descriptions of all Project new construction activities are contained in the D & C *sub-proposal* (# 8811525).

g. Facilities and equipment

Please refer to the individual *sub-proposals* for descriptions of facilities and equipment in use or needed by the Project.

h. Budget

Please refer to the individual *sub-proposals* for budget justification narratives.

Section 9. Key personnel

Please refer to the individual *sub-proposals* for personnel information.

Section 10. Information/technology transfer

The technical information resulting from this Project (and its component tasks) will be distributed in the following ways:

- A completion (annual) report will be submitted to Bonneville at the close of the fiscal (calendar) year and Bonneville will distribute copies to all individuals and agencies on its mailing list.
- Where appropriate, results from this Project will be presented in papers in peer-reviewed journals and at professional meetings.

- Excerpted data will be appropriately formatted and submitted to the Northwest Aquatic Information Network (StreamNet) and made available to the public via the Internet.
- As an element of the YKFP, the objectives and findings of this Project will also be entered into the YKFP home-page on the Internet. This home-page is currently under construction, and should be operational some time in 1998. The kind of information posted to the YKFP home-page will differ somewhat from that posted to StreamNet. Specifically, the YKFP Internet site will contain more detailed and site-specific information than that in StreamNet, which has a regional perspective and therefore aggregates data in standardized units of larger geographic scope. There will also be more different kinds of data posted to the YKFP site than can presently be accommodated by StreamNet.
- The results of this study will also be presented and critiqued in an annual workshop hosted by the YKFP, the “Project Annual Review”. The Yakama Indian Nation can be contacted for abstracts of presentations made at this workshop.

Congratulations!